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METHOD FOR DRINKING WOOD

The invention relates to a method for soaking wood, if necessary bottom drying process, whereby the wood in a treatment bath becomes treated with a temperature exceeding the room temperature.

That moisture content of the primary raw materials of the woodworking industry, so z. B. that moisture content of the cut commodity, possible no immediate other processing, in addition the wood must become dried.

The large amount of the industrial processed wood the made elaboration of artificial drying methods inevitably, in order to accelerate the natural drying process with the duration from 2 to 5 years to.

The drying process of wood by means of preheated air becomes in an handbook of the wood working [A., Lugosi: Faipari kezikönyv (handbook of the wood industry), M5szaki Könyv bad6, Budapest, 1976] described. Therefore this method with the subsequent, significant drawbacks is connected: - large energy requirement; - the treated wood can suffer a distortion of substantial extent; - in the treated wood significant mechanical stresses can develop; - the changes of measure of the treated wood arising in humid environment can exceed the changes of measure on natural way of the dried wood substantial.

The Hungarian patent specification No. a method describes 190,088, according to which a nitric acid solution becomes sprayed on the wood located in the drying area. Reduced this method the listed above drawbacks, which used nitric acid solution can endanger however the environment, in addition the drying unit must become because of the elevated corrosion aggressiveness from expensive materials prepared.

An other drawback of the known drying methods is the circumstance that the dried wood takes a significant amount water in an humid environment again on. The wood durably located in moist state is again a damage exposed. Simultaneous ones can cause also various pests (insects, rodents and microorganisms) to the wood a damage.

The wood dried on conventional manner therefore requires a protection, a conservation, which in a downstream method granted can become. The patent specifications GB 1,168,062 and DE 2,431,595 describe methods, in which an aqueous paraffin emulsion with fungicide and insecticide additives becomes used. These methods cannot prevent an additional

⌘ top water uptake however.

In courses of the elaboration in the Hungarian patent specification No. 198,644 of described method an energy-saving method became the object set, an additional water uptake of the treated wood prevented. The method becomes performed in two steps, whereby become used in the eizelnen steps treatment baths different composition. The treatment bath of the second step contains free formaldehyde in an amount of 8 Masse%. That cannot be agreed again with the current tendency of the woodworking technologies, according to which desired from the view of environmental protection the elaboration and application of methods without formaldehyde are or only with a low content at formaldehyde.

Those relative large oligomeren molecules for soaking wood in accordance with prior art process [Hungarian patent specification No. 198,644] of used synthetic resins, as polyesters or Karbamidformaldehyd resins can only on complicated and expensive way in the wood brought becomes. These compounds fill out mainly the Zwi schenräume of the fiber, whereby the original character of the treated wood becomes changed and the plastic materials similar, whereby its density increases.

An other drawback of the prior art processes for soaking and conserving wood represents the circumstance that the treated wood may not become because of the used fabrics the preparation of plants of the food industry and with foods in contact coming mechanisms used.

To the state of the art a durable protection for moist wood can become only by drying and soaking, used as two separated methods, ensured. This circumstance elevated both the capital outlays and the operating cost of the treatment.

A need shows up to a method, which the treatment of wood in a single method, simple and with favourable first cost, without the application of environmentally hazardous fabrics possible, and the determination of wood corresponding its conservation and/or its dyeing or its applicability in the food industry ensured, further of the cracking causes of Verarbeitungsverluste reduced.

In conformity with the preceding treated circumstances the development of a method became set the object of the invention, which is feasible the discussed drawbacks of the prior art processes eliminated and for soaking wood as a single combined method, simple and with favourable first cost, with low Verarbeitungsverlusten as well as without the application of environmentally hazardous fabrics.

The invention is based on the finding that in the case essentially a liquid exchange takes place to the drying process accomplished in the treatment bath of the impregnation method; from the wood outgoing waters replaced becomes by the soaking means, whereby the cracking and the distortion of the wood can become to a large extent suppressed.

The flow of the liquid exchange can become by the action of other influences (as by centrifugal field, electrostatic or other fields) accelerated. By the application of a centrifugal field also the effectiveness of the method becomes elevated. During the centrifugation the liquid exchange goes to made in the Zwi schenraum the cells before itself, soaking the cells themselves to the centrifugation in the phase of the method, which with a temperature exceeding the room temperature bottom exit of water vapor runs off.

Furthermore the invention is based on the finding that in the treated wood for a polymerized soaking means bottom substantial more favorable conditions can be provided, if brought instead of the introduction of large polymer molecules drying oils become as polymerizable monomers in the wood, and the polymerization in the wood performed becomes.

The polymerization runs off also as a natural procedure, the time requirement of this process can however several months amount to. The flow of the process can become with elevated temperature (80 to 140 degrees), in the presence of a gaseous reaction means and/or by irradiation accelerated. The polymerization in the liquid phase with elevated temperature preferred reaction means of the type become peroxide in the amount of 0,1 to 50 Masse% used. The speed of the polymerization process can become in the case of chemical initiation in the liquid phase by additions regulated, those as if radical-intercept work like hydroquinones, or a redox system represent like Kobaltnaphthenat and p-toluidine.

Accordingly the invention represents a method for soaking wood, if necessary to bottom drying process, whereby the wood in a treatment bath becomes treated with a temperature exceeding the room temperature. The invention process becomes performed, by one A) the wood into a treatment bath brings, which contains an unmodified or modified drying oil as soaking means at least and if necessary at least an addition, to b) the treatment bath on a temperature of 80 to 150 degrees heated, and if necessary at the most 20 hours this temperature, C) the treatment bath cooling maintains leaves, D) the wood from the treatment bath lifts, e) if necessary the process steps A) to D) or b) and C) once or several times repeated, f) and if necessary in the wood the located, at least an addition contained soaking means by an heat treatment with a temperature from 80 to 140 °C with a gaseous reaction means or with the mixture of gaseous reaction means with elevated pressure and/or by irradiation polymerized.

The invention process can preferably become in treatment baths performed, which as additions dye (e), against pests increasing (s) agent, combustibility decreasing (s) agents, other polymerizable monomers, polymerization auxiliary material (e), wax (e), oil product (e), liquid silicone and/or solvents contain the resistance.

The invention process can become equally the treatment of resinous wood, hardwood or fiber boards, plywood plates or wood press plates used.

In accordance with a preferred variant of the invention process a treatment bath becomes used, which contains by means of epoxydiester alkyd resins modified and/or with Hydroxymethacrylaten metered drying oils.

The process step A) of the invention process can preferably become in a centrifuge performed.

As dyes z can. B. pigment-free, fat-soluble dyes and as gaseous reaction means oxygen, ozonosphere, olefine monomers, ethylene oxide, carbon dioxide and hydrogen peroxide used become.

For the irradiation IR jets, microwaves, high frequency of fields come; X ray, hard gamma rays, thermal and rapid neutrons; Beta rays, electron beams and W-jets in question.

As other monomers preferably olefines, Hydroxymethacrylate can, than polymerization auxiliary materials become organic peroxides, Sikkative, p-toluidine and hydroquinone used.

As solvents z can. B. Hydrocarbons, chlorinated hydrocarbons, aldehydes, Ketone and ester used become.

The invention process exhibits the subsequent substantial advantages: - The time and energy requirement of the method are smaller compared with methods in accordance with the state of the art.

Contrary to the artificial drying methods the water leaves the wood to beginnings of the invention process mainly not as steam, but as liquid, which the method in energetic and thus economical respect favourable affected and its time requirement reduced. From the treated wood outgoing waters become at the bottom of the container from there discharged collects itself and can.

- The Verarbeitungsverlust of the treated wood decreases to paths of the reduced inclination for cracking.
- In the frame of the practice-conditional requiring the invention process - independent of the dimensions of the product which can be treated - leads generally speaking cross section to soaking, if necessary bottom drying process.
- The additional water uptake as well as the inclination for distortion or to the later change of the dimensions decrease in substantial mass.
- By addition of additions, which selected dependent of the determination of the wood which can be treated becomes, conservation can become against pests and/or dyeing and/or reduction of combustibilities or applicability in the food industry ensured.
- The invention process can with all timber materials used in the woodworking industry like block-like or processed products of each type, like z. B. Cut commodity, fiber boards, plywood plates or wood press plates - independent of the wood sort - used become.

In the other the invention becomes more near discussed on the basis Ausführungsbeispielen.

The examination by compressive load, treated in the examples, serves for the simple and rapid control of soaking. In case of of samples made from the same wood sort with same dimensions a correlation between the amount of the treatment bath pressed from the sample and the effectiveness of soaking exists. The various products - under it also those for Konstruktionszwecke used timber materials - are the bottom practical operating conditions of a stress exposed, which lies around several orders of magnitude the bottom test load (49,050 N/cm²). Bottom consideration of this circumstance it cannot be concluded by seeping the treatment bath from the treated wood on the fact that this appearance arises to the also bottom practical operating conditions.

Example 1

In an open container, which is provided at its bottom with a drain stub, a treatment bath becomes from 10 Masse% Holzöl and 90 measures linseed oil prepared.

As samples beech wood prisms with the dimensions of 40x40x300 mm and with a moisture content of 60 Masse% become placed in the treatment bath. The treatment bath will within 2 hours on the temperature of 80 degrees of heated, subsequent becomes the temperature up to reaching the final temperature of 105 degrees with a speed of 5 degrees/hour other elevated, whereby the liquid outgoing from the prisms becomes temporary discharged. After a treatment time of 3 hours with a temperature of 105 degrees the decrease of the amount of the steam and gases outgoing from the wood can become in the form of bubbles visual found. One switches the heater off, and leaves the treatment bath cooling. After a residence time of 5 hours the prisms from the treatment bath are lifted, and one lets the remainders of the treatment bath of the surface of the prisms run off. After that parts of the prisms found can become that generally speaking crosswise cut

a soaking made. (By the application of a compressive load oil can become also from the internal layers pressed.) After ablation of the outer layers of the prisms specimens are worked out, 6786/13 performed at which the studies become in accordance with the Hungarian standard MSZ (determination of the water uptake of specimens of the dimensions 2,5x2,5x2,5 cm after a storage with a duration of 24 hours in distilled water).

The studies show a water uptake of 8 Masse%.

The described studies became performed at prisms, which were worked out from the subsequent wood: Larch, fir, Hagebuchen, ash, calibration, lime tree, acacia and Mahagoniholz. It could become found that Eschenholz is to be soaked most with difficulty, the other studies became therefore - with the exception of examples 2 and 3 - at ash wood prisms performed.

Example 2

Into with the treatment bath in accordance with example 1 filled centrifuge pipes are slid beech wood prisms of the dimensions 2x2x8 cm, afterwards the centrifuge for the durations of 10 minutes becomes operated with a speed of 1500/Minute.

The examination of the cross sections of the prisms after the centrifugation shows that soaking homogeneous made.

By control of subsequent drying of the soaked prisms found can become that that can become moisture content of the wood by a liquid exchange during the centrifugation - related to the dry content of the wood - on 16 Masse% reduced.

The water uptake the specimen dried treated on the described manner and amounts to 12 to 16 Masse%. (It is noticed that in this case the cross section of the specimens the bottom in the standard MSZ was appropriate for 6786/13 prescribed value of 2,5x2,5 cm.)

Example 3

The operation described in example 2 becomes repeated with the difference that as treatment bath a varnish with the trade name TIMBEREX (manufacturers: TIMBEREX, Great Britain) into the centrifuge pipes filled becomes. The prisms are centrifuged in this treatment bath because of the larger viscosity 20 minutes prolonged with a speed by 2000/Minute.

The examination of the cross sections of the prisms after the centrifugation shows that a liquid exchange takes place and soaking homogeneous made.

The specimen treated on the described manner subsequent in an oven tear-free dried can become.

Example 4

The operation described in example 1 becomes repeated with the difference that the dye with the trade name NEPTUN BLACK ONE (manufacturer: BASF, FRG) in an amount from 1,6 Masse% to the treatment bath given becomes.

The examination of the cross sections of the prisms after the treatment shows that soaking and/or. the distribution of the dye in the length and in the cross section homogeneous made.

Example 5

The operation described in example 1 becomes repeated with the difference that the subsequent products become the treatment bath given: 0,5 Masse% of SICCOSOL (manufacturers: BUDALAKK, Budapest, Hungary) and 10 Masse% of 2, 5-Dimethyl-2, 5-di (third. - butylperoxy) - hexane (INTEROX DHBP, manufacturer: Peroxide chemistry GmbH, FRG), further Parkettbrettchen of the dimensions 25x80x1200 mm of impregnated become, which become after cooling the initiation of the polymerization process 3 hours with one temperature of 125 degrees and subsequent complete hardening 8 hours with a temperature of 110 degrees of stored.

From the interior of the Parkettbrettchen treated on the described manner specimens are tet herausgearbei, their water uptake, tested in accordance with the standard MSZ 6786/13, after one immersing duration of 24 hours 15 Masse% amount to.

From the interior of the specimens - due to the complete cure - an even bottom compressive load of 49,050 N/cm² no soaking means can become pressed.

Example 6

In accordance with example 5 soaked prisms become exposed for the durations of 12 hours of a gamma radiation of the intensity of 0,8 Gray/hour.

The water uptake on the described manner treated and in accordance with the standard MSZ 6786/13 tested specimen amounts to after one immersing duration of 24 hours 12 Masse%.

Example 7

In accordance with example 5 soaked prisms become stored for the durations of 24 hours with 60 degrees in a space, which contains pure oxygen gas with a pressure of 5 bar.

The water uptake on the described manner treated and in accordance with the standard MSZ 6786/13 tested specimen amounts to after one immersing duration of 24 hours 6.5 Masse%.

Example 8

The operation will repeated with the difference, described in example 1 that the prisms after the treatment in the treatment bath in accordance with example 1 into a second treatment bath in accordance with example 3 immersed to become, which before still p-toluidine in an amount of 0,5 Masse% given becomes, and one leaves the prisms in the second treatment bath cooling.

After ablation of the outer layers of the prisms specimens are worked out, whose water uptake, tested in accordance with the standard MSZ 6786/13, amounts to 10 Masse%.

From the interior of the specimens does not become a bottom compressive load of 49,050 N/cm² a tough, very viscous, complete cured resin pressed.

Example 9

The operation described in example 2 becomes repeated with the difference that one leaves the prisms in a treatment bath cooling, which 1 Masse% of SICCOSOL (manufacturers: BUDALAKK, Budapest, Hungary) contains.

From the interior of the prisms treated on the described manner specimens are worked out, whose water uptake, tested in accordance with the standard MSZ 6786/13, amounts to after one immersing duration of 24 hours 8 Masse%.

Example 10

The operation described in example 8 becomes repeated with the difference that one leaves the prisms in a treatment bath cooling, which 0.5 Masse% of p-toluidine and 1 Masse% of SICCOSOL (manufacturers: BUDALAKK, Budapest, Hungary) contains, and subsequent soaking means with a temperature of 110 degrees, located in the prisms, one polimerisiert.

From the interior of the prisms treated on the described manner specimens are worked out, whose water uptake, tested in accordance with the standard MSZ 6786/13, amounts to after one immersing duration of 24 hours 3.8 mass.

From the interior of the specimens an even bottom compressive load of 49,050 N/cm² no resin can become pressed.



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Claims

1. Method for soaking wood, if necessary bottom drying process, whereby the wood in a treatment bath becomes treated with a temperature exceeding the room temperature, characterised in that one A) the wood into a treatment bath brings, which as soaking means at least an unmodified or modified drying Ö1 contains and if necessary at least an addition,) the treatment bath to b on a temperature of 80 to 150 degrees heated, and if necessary, leaves C) the treatment bath cooling maintains at the most 20 hours this temperature, D) the wood from the treatment bath lifts, e) if necessary the process steps A) to D) or b) and C) once or several times repeated, f) and if necessary in the wood the located, at least an addition contained soaking means by an heat treatment with a temperature from 80 to 140 C, with a gaseous reaction means or the mixture of gaseous reaction means with elevated pressure and/or by irradiation polymerized.
2. Process according to claim 1, characterised in that dye (e), the resistance against pests increasing (s) agent, combustibilities decreasing (s) agents, other polymerizable monomers, polymerization auxiliary material (e), wax (e), oil product (e), liquid silicone and/or solvent than additions of the treatment bath used becomes.
3. Process according to claim 1, characterised in that resinous wood, hardwood or fiber boards, plywood plates or wood press plates treated becomes.
4. Process according to one of claims 1 to 3, characterised in that a treatment bath used becomes, which contains by means of epoxydierter alkyd resins modified and/or with Hydroxymethacrylaten metered drying oils.
5. Process according to claim 1, characterised in that the process step A) in a centrifuge performed becomes.

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